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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VITAL, PIERRE M

ART UNIT PAPER NUMBER

2188

DATE MAILED: 07/16/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

8

Office Action Summary

Application No.

10/087,524

Applicant(s)

YAGISAWA ET AL.

Examiner

Pierre M. Vital

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3, 10 and 12-14 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Office Action is in response to applicant's communication filed April 19, 2004 in response to PTO Office Action mailed December 18, 2003. The Applicant's remarks and amendments to the claims and/or the specification were considered with the results that follow.
2. Claims 1-14 have been presented for examination in this application. In response to the last Office Action, claims 1-10 and 12-14 have been amended. Claim 11 has been canceled. No claims have been added. As a result, claims 1-10 and 12-14 are now pending in this application.

Response to Arguments

3. Applicant's arguments and amendment to the claims, see Paper No. 7, filed April 19, 2004, with respect to the rejection(s) of claim(s) 1-10 and 12-14 under 35 U.S.C. 102(e) and 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn due to the claims amendment. However, upon further consideration, a new ground(s) of rejection is made in view of F.
4. Applicant's arguments with respect to amended claims 1-10 and 12-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

5. Claims are objected to because of the following informalities:

In claim 1, line 2, it appears that "disk array" should be changed to --disk array--.

In claim 3, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 3, line 2, it appears that "disk array" should be changed to --disk array--.

In claim 4, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 5, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 6, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 7, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 8, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 9, lines 2-4, it appears that "disk array" should be changed to --disk array--.

In claim 9, line 7, it appears that "disk array" should be changed to --disk array--.

In claim 9, line 8, it appears that "disk array" should be changed to --disk array--.

In claim 10, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 12, line 1, it appears that "disk array" should be changed to --disk array--.

In claim 13, lines 1-3 and 5, it appears that "disk array" should be changed to --disk array--.

In claim 13, lines 12, 15, 20, 24, 30 and 31, it appears that "disk array" should be changed to --disk array--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, 4-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwatani et al (US6,079,029) and Yorimitsu et al (US5,734,859).

As per claims 1, 7 and 9, Iwatani discloses a method for copying data in a disk array apparatus comprising $m + n$ disk devices partitioned into a first group of n disk devices and a second group of m disk devices, said method including:

reading data of $m-1$ units from said first group of n disk devices

[*reconstructing data from a fetched device*; col. 6, lines 39-41]; forming redundant data based on the data of $m-1$ units read from said first group of n disk devices [*recovering the redundancy*; col. 6, lines 42-44]; wherein n and m are different integers [*first group has N devices, second group has $N+1$ devices*; col. 6, lines 33-36]; a controller coupled to said $m + n$ disk devices [*controller 10*; Figs. 1-3].

However, Iwatani does not specifically teach storing each data of $m-1$ units and said redundant data in any one of said m disk devices of said second group as recited in the claim.

Yorimitsu discloses storing each data of $m-1$ units and redundant data in any one of m disk devices of a second group to obtain a high reliability of data (col. 8, lines 40-44). Since the technology for storing $m-1$ units of data and redundant data in any one of

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m disk devices of a second group was well known and since storing m-1 units of data and redundant data in any one of m disk devices of a second group provides a high reliability of data, an artisan would have been motivated to implement this feature in the system of Iwatani. Thus, It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Iwatani to include storing m-1 units of data and redundant data in any one of m disk devices of a second group because it was well known to provide a high reliability of data as taught by Yorimitsu.

As per claim 2, Iwatani discloses the claimed invention as detailed above in the previous paragraphs. However, Iwatani does not specifically teach the unit of data is a predetermined data length as recited in the claim.

Yorimitsu discloses a unit of data is a predetermined data length to obtain a high reliability of data (col. 8, lines 40-44). Since the technology for implementing a unit of data as a predetermined data length, and since a unit of data as a predetermined data length provide a high reliability of data, an artisan would have been motivated to implement this feature in the system of Iwatani. Thus, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to modify the system of Iwatani to include a unit of data as a predetermined data length because it was well known to provide a high reliability of data as taught by Yorimitsu.

As per claim 4, the combination of Iwatani and Yorimitsu discloses the claimed invention as detailed with respect to claim 1 above in the previous paragraphs. Iwatani further discloses an n control means for controlling the n disk devices [controller 10; Figs. 1-3]; an m control means for controlling said m disk devices [controller 10; Figs. 1-3].

Claim 5 is rejected as per claim 2 above.

Claim 8 is rejected as per claim 1 above.

Allowable Subject Matter

8. Claims 3, 10, and 12-14 are allowed.
9. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
10. The following is a statement of reasons for the indication of allowable subject matter:

As per claim 3, the prior art of record does not teach or suggest "halting duplicating data based on an instruction from a computer; storing data received from said computer, during interruption of data duplicating, in n disk devices of a first group while recording location information of stored data; restarting data duplicating based on

an instruction from said computer; storing certain data of m-1 units as designated by the recorded location information and redundant data in m disk devices of a second group” in combination with the other elements set forth in the claimed invention.

As per claim 6, the prior art of record does not teach or suggest “means for interrupting a duplex means in accordance with an instruction from a computer; and update management means for recording location information indicating location in said n disk devices to which data received from said computer is stored during interruption of said duplex means, wherein said m control means stores certain data designated by said location information in said m disk devices, when said duplex means restarts data duplicating in accordance with an instruction from aid computer” in combination with the other elements set forth in the claimed invention.

As per claims 10 and 13, the prior art of record does not teach or suggest “an LU mirror subprogram stored in a memory for writing data received from a computer into a mirror primary LU and a mirror secondary LU for maintaining duplicated data in said mirror primary LU and said mirror secondary LU; a non-mirror event update monitor subprogram stored in said memory for monitoring data update with respect to said mirror primary LU upon interruption of duplicating data between said mirror primary LU and said mirror secondary LU; a non-mirror event update position management subprogram stored in said memory for recording an update position of said data update with respect to said mirror primary LU; and a mirror resynchronous subprogram stored

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in said memory for copying data designated by the recorded update position from said mirror primary LU to said mirror secondary LU, wherein n and m are different integers” in combination with the other elements set forth in the claimed invention.

Therefore, dependent claim 12 and 14 is allowable as being dependent upon independent claims 10 and 13 respectively and having additional allowable features therein.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is required under 37 C.F.R. § 1.111 (c) to consider these references fully when responding to this action. The documents cited therein teach partitioning disk array into different groups and storing redundant data on different groups of memory devices.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre M. Vital whose telephone number is (703) 306-5839. The examiner can normally be reached on Mon-Fri, 8:30 am - 6:00 pm, alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on (703) 306-2903. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

July 12, 2004

Pierre M. Vital
Pierre M. Vital
Examiner
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